IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl.No.: 09/855,567 Confirmation No.: 1528
Appellant: McCree
Filed: May 15, 2001
TC/AU: 2655
Examiner: Opsasnick

Docket: TI-29772
Cust.No.: 23494

APPELLANT'S BRIEF

Commissioner for Patents
P.O.Box 1450
Alexandria VA 22313-1450

Sir:

The attached sheets contain the Rule 41.37 items of appellant's brief; this brief is pursuant to MPEP 1204.01 (Reinstatement of Appeal). The fee for filing a brief in support of the appeal has previously been paid; and the Commissioner is hereby authorized to charge any other necessary fees to the deposit account of Texas Instruments Incorporated, account No. 20-0668.

Respectfully submitted,

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Rule 41.37(c)(1)(i) Real party of interest

Texas Instruments Incorporated owns the application.

Rule 41.37(c)(1)(ii) Related appeals and interferences

There are no related dispositive appeals or interferences.

Rule 41.37(c)(1)(iii) Status of claims

Claims 1-8 are pending in the application with all claims finally rejected. This appeal involves the finally rejected claims.

Rule 41.37(c)(1)(iv) Status of amendments

There is no amendment after final rejection.

Rule 41.37(c)(1)(v) Summary of claimed subject matter

The invention provides wideband (0-8 kHz) speech coding with linear prediction (LP) coding for both the lowband (0-4 kHz) and the highband (4-8 kHz); the lowband LP filter excitation is encoded, but the highband LP filter excitation is synthesized from noise modulated by a portion of the lowband signal and a scale factor. Claims 1, 3, 5, and 7 relate to encoding and claims 2, 4, 6, and 8 relate to decoding. Figure 1c shows decoding with the highband excitation using a portion of the decoded lowband synthesized speech ("2.8-3.8 KHz bandpass filter") and application page 9, paragraph (5) describes the highband excitation synthesis ("| lbdh'(m) |" is the absolute value of lowband decimated high portion described in paragraph (2) on page 9). Conversely, Figure 1b shows encoding using a portion of the lowband speech ("2.8-3.8 KHz bandpass filter") to find the scale factor, and application paragraph (4) on page 7 and paragraph (8) on page 8 describe this.

Rule 41.37(c)(1)(vi) Grounds of rejection to be reviewed on appeal

The grounds of rejection to be reviewed on appeal are:

(1) claims 1-8 were rejected as unpatentable over the Tucker reference in view of the Liljeryd reference.

Rule 41.37(c)(1)(vii) Arguments

(1) Claims 1-8 were rejected as unpatentable over Tucker in view of Liljeryd; the Examiner cited the two excitations for a wideband synthesis filter of Tucker Figs. 5-6 and added Liljeryd lowband-highband information extrapolation.

With regard to decoding claims 2, 4, 6, and 8, appellant replies that the claims require the excitation for the highband be noise modulated by a portion of the already-decoded lowband signal. Tucker Fig.5 (and column 12, lines 3-21) has the excitation being the weighted sum of periodic (pitch) pulses plus noise; there is no suggestion of using a portion of the lowband signal to modulate noise for the highband excitation; pitch pulses are not a portion of the lowband.

Liljeryd does not suggest otherwise. Indeed, Liljeryd is a general spectral expansion method which is performed after the decoding; see Liljeryd Fig.1. That is, both the claims and Tucker synthesize wideband speech from encoded lowband and highband information; whereas, Liljeryd takes already-synthesized lowband signals and fabricates a highband to add to the lowband to create a wideband signal. The time-domain excitation of an LP filter in the claims and Tucker has no relation to the frequency-domain spectral expansion of Liljeryd. Consequently, Tucker plus Liljeryd do not suggest the decoding claims.

With regard to encoding claims 1, 3, 5, and 7, appellant replies that the claims require encoding the highband so that the excitation is noise modulated by a portion of the lowband signal. Again, Tucker uses a weighted sum of periodic pulses plus noise as excitation; there is no suggestion of noise modulated by a portion of the lowband, and again Liljeryd is a spectral expansion performed after synthesis and not as part of any encoding. Consequently, Tucker plus Liljeryd do not suggest the encoding claims.

Rule 41.37(c)(1)(viii) Claims appendix

1. A method of wideband speech encoding, comprising:

(a) partitioning a frame of digital speech into a lowband and a highband;

(b) encoding said lowband;

(c) encoding said highband using a linear prediction excitation from noise modulated by a portion of said lowband; and

(d) combining said encoded lowband and said encoded highband to form an encoded wideband speech.

2. A method of wideband speech decoding, comprising:

(a) decoding a first portion of an input signal as a lowband speech signal;

(b) decoding a second portion of an input signal as a noise-modulated excitation of a linear prediction encoding wherein said noise modulated excitation is noise modulated by a portion of the results of said decoding as a lowband speech signal of preceding step (a); and

(c) combining the results of foregoing steps (a) and (b) to form a decoded wideband speech signal.

3. A wideband speech encoder, comprising:

(a) a lowband filter and a highband filter for digital speech;

(b) a first encoder with input from said lowband filter;

(c) a second encoder with input from said highband filter and said lowband filter, said second encoder using an excitation from noise modulated by a portion of output from said lowband filter; and

(d) a combiner for the outputs of said first encoder and said second encoder to output encoded wideband speech.

4. A wideband speech decoder, comprising:

(a) a first speech decoder with an input for encoded narrowband speech;

(b) a second speech decoder with an input for encoded highband speech and an input for the output of said first speech decoder, said second speech decoder using excitation of noise modulated by a portion of the output of said first speech decoder; and

(c) a combiner for the outputs of said first and second speech decoders to output decoded wideband speech.

5. The method of claim 1, further comprising:

(a) decimating the sampling rate of both said lowband and said highband;

(b) encoding said decimated lowband from step (a) including a first method of quantization;

(c) reversing the spectrum of a baseband image of said decimated highband from step (a); and

(d) encoding the results of step (c) including said first method of quantization.

6. The method of claim 2, wherein:

(a) said decoding a first portion of an input signal as a lowband speech signal includes using a first codebook; and

(b) said decoding a second portion of an input signal as a highband speech signal includes using said first codebook.

7. The wideband speech encoder of claim 3, wherein:

(a) said first encoder uses a first quantizer; and

(b) said second encoder using said first quantizer.

8. The wideband speech decoder of claim 4, wherein:

(a) said first speech decoder with an input for encoded narrowband speech includes an LP codebook; and

(b) said second decoder using said LP codebook.

Rule 41.37(c)(1)(ix) Evidence appendix

n/a

Rule 41.37(c)(1)(x) Related proceedings appendix

n/a